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SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
08/330,797	10/28/94	YAMAZAKI	07561101

SIXBEY FRIEDMAN LEEDOM AND FERGUSON
2010 CORPORATE RIDGE SUITE 600
MC LEAN VA 22102

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WILCZEWEXAMINER

ART UNIT

PAPER NUMBER

1107

DATE MAILED:

05/14/96

Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Pat nts

Office Action Summary

Application No.

08/330,797

Applicant(s)

Yamazaki et al.

Examiner

Mary Wilczewski

Group Art Unit

1107



☒ Responsive to communication(s) filed on Feb 14, 1996

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 8-15, 21-23, 27-29, 35, 36, and 41-46 is/are pending in the application.

Of the above, claim(s) 35 and 36 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 8-15, 21-23, 27-29, and 41-46 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☒ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 8-11, 13, and 27-29 are rejected under 35 U.S.C. § 102(a) or 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over Miyachi et al, of record.

Miyachi et al. disclose an apparatus which comprises a film-forming chamber 1 for forming an amorphous semiconductor film and a dehalogenating-hydrogenating chamber 2, see figure 5, for example. The two chambers are combined by a conveying device 13. The substrates 10 move between the two chambers without being exposed to outside air. Note in Example 14 that the dehalogenation-hydrogenation is preferably performed by light irradiation using, for example, an ultraviolet laser, a visible light laser, or a carbon dioxide laser, see column 18, lines 29-43.

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Claims 21-23 are rejected under 35 U.S.C. § 103 as being unpatentable over Miyachi et al. in view of Yamazaki et al., U.S. Patent 4,888,305, both of record.

Miyachi et al. is applied as supra. Miyachi lacks anticipation of introducing the laser light through a window provided in the wall of the chamber. Yamazaki et al. disclose an apparatus for photo annealing non-single crystalline silicon films in which light irradiation is carried out by irradiating the interior of a reaction chamber with an excimer laser through a window, see figure 1 and column 2, lines 38-41. Therefore, it would have been obvious to the skilled artisan that the laser light used in the known method of Miyachi could be introduced through a window provided in the wall of the dehalogenating-hydrogenating chamber thereby allowing control of the laser without exposing the substrate to outside air.

Claims 8, 14, and 15 are rejected under 35 U.S.C. § 103 as being unpatentable over Begin et al. in view of Miyachi et al., both of record.

Begin et al. disclose an apparatus for processing semiconductor wafers which includes satellite reaction chambers 60, 62, 64, and 66 disposed around the periphery of central chamber 14, see figure 1. A robot assembly 16 comprising arms 18, 20, and 22 is disposed in central chamber 14. Assembly 16 moves the substrate 12 to any position within the

apparatus. Begin lacks anticipation only of disclosing that reaction chambers 60, 62, 64, and 66 comprise an irradiation chamber and a vacuum apparatus. However, Miyachi discloses an apparatus which comprises an irradiation chamber (the dehalogenating-hydrogenating chamber) and a vacuum chamber for depositing an amorphous semiconductor layer. Therefore, it would have been obvious to one skilled in the art that the processing chambers of Miyachi et al. could have been used in the known apparatus of Begin.

Claims 41-46 are rejected under 35 U.S.C. § 103 as being unpatentable over Begin et al. in view of Miyachi et al., Nakayama et al., and Kawasaki et al. further in view of Codama, all of record.

Begin et al. disclose an apparatus for processing semiconductor wafers which includes satellite reaction chambers 60, 62, 64, and 66 disposed around the periphery of central chamber 14, see figure 1. A robot assembly 16 comprising arms 18, 20, and 22 is disposed in central chamber 14. Assembly 16 moves the substrate 12 to any position within the apparatus. Begin lacks anticipation only of disclosing that reaction chambers 60, 62, 64, and 66 comprise an irradiation chamber and a vacuum apparatus. However, apparatuses used for depositing an amorphous silicon layer, for irradiating an amorphous silicon layer for dehalogenating and hydrogenating the layer, for etching and plasma doping the layer are all well known in the art, see Miyachi et al., Kawasaki et al., and Nakayama et al., respectively. Codama discloses a method of fabricating a thin film transistor which includes the steps of depositing an amorphous silicon, etching the silicon layer, the gate layer, and the gate insulating layer, plasma doping the silicon layer to form source and drain regions, see

column 1, lines 42-46, and hydrogenating the silicon layer. Therefore, in light of the semiconductor device process disclosed by Codama, it would have been obvious to the skilled artisan to include the necessary processing chambers required to practice the method of Codama on the known apparatus of Begin et al.

The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. § 112, first paragraph, as the specification, as originally filed, fails to provide support for the invention as presently claimed..

Amended claims 8, 21, and 27, as well as newly presented claims 41, 42, and 44-46, recite that a *linear* laser light is used to irradiate the substrate. Applicant has relied on page 8 of the specification for support for this limitation. However, on page 8 of the specification, ^{there} ~~the~~ is no disclosure that the laser light used in the method of the subject application is linear. On page 8 it is disclosed that the cross section of the laser beam can be shaped into a rectangular form. Presumably, this is what Applicant is referring to as a *linear* laser light, however, Applicant does not disclose in the specification that a laser beam having a rectangular cross section is considered a *linear* laser light, as presently claimed. Whereas Applicant can be his own lexicographer, any term used by Applicant must be

clearly defined in the specification. In the present case, there is no definition for *linear laser light* set forth in the originally-filed specification.

Claims 8-15, 21-23, 27-29, 41, 42, and 44-46 are rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the objection to the specification.

Claims 8-15, 21-23, 27-29, 41, 42, and 44-46 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 8, 21, 27, 41, 42, and 44-46, it is unclear what is meant by the term "linear laser light", note also rejection supra under 35 U.S.C. § 112, first paragraph.

In light of the amendment to claim 8 in application serial no. 08/160,909, and the amendments to the claims of the subject application, the methods recited in the claims of the two applications are deemed patentably distinct and, therefore, the double patenting rejections made in the previous Office action have been withdrawn.

Applicant's arguments filed February 14, 1996, have been fully considered but they are not deemed to be persuasive.

Applicant has argued that the prior art of record does not teach or suggest using a *linear* laser light to irradiate the substrate. However, the claims do not actively recite an apparatus which includes any type of laser. The claims merely require an irradiation chamber or a chamber for treating a substrate with linear laser light. Therefore, the linear laser light is only recited in a statement of intended use for the chamber and is not given any weight in determining patentability. Moreover, the prior art applied against the instant

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claims clearly recites the use of lasers which are typically scanned across the semiconductor surface. Since the claims are to be given the broadest possible interpretation, theoretically, the laser beam of the prior art which is typically scanned across the surface of a substrate can be considered a *linear laser light*. In addition, as discussed in the rejection supra under 35 U.S.C. § 112, first paragraph, if Applicant intended the linear laser light term to refer to a laser beam having a rectangular cross section, not only does the laser need to be actively recited in the claims, so too must any parts of the apparatus which shape the laser beam into a rectangular form be actively recited in the claims, the lens 13.

Applicant's amendment necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL.** See M.P.E.P. § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

Any inquiry concerning this communication should be directed to Mary Wilczewski at telephone number (703) 308-2771.


MARY WILCZEWSKI
PRIMARY EXAMINER
GROUP 1100